

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application.

Claims 1-23 are pending. Claims 1, 2, 6, 11-14, 17, 22, and 23 are amended. Claims 1 and 13 are independent.

Reconsideration of this application, as amended, is respectfully requested.

Drawings

The formal drawings filed with the present application are accepted. The Examiner is courteously requested to provide a Notice of Draftsperson's Patent Drawing Review, Form PTO-948, confirming approval of the formal drawings, with the next official communication.

Claim for Priority

The Examiner has acknowledged Applicants' claim for foreign priority under 35 U.S.C. §119 and receipt of the certified copy of the priority document.

Information Disclosure Statement

The Examiner has acknowledged receipt of the Information Disclosure Statement filed July 2, 2001, and has returned an initialed copy of the Form PTO-1449.

Objection to Specification

The disclosure is objected to as containing an informality. By this Amendment, the specification is amended in the paragraph beginning on page 1, line 17, to eliminate the language deemed informal by the Examiner and to make other minor modifications. Accordingly, withdrawal of the objection to the disclosure is respectfully requested.

Claim Objections/Rejection under 35 U.S.C. §112, second paragraph

Claims 2, 6, 11, 12, 14, 17, 22, and 23 are objected to as containing informalities, and claims 2, 6, 14, and 17 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

By this Amendment, these claims are amended to eliminate any language deemed informal or indefinite by the Examiner. It is respectfully submitted that the amended claims are clear, definite, and provide full antecedent basis for the elements recited therein. Accordingly, withdrawal is requested of the

claim objections and the rejection under 35 U.S.C. §112, second paragraph.

Rejections under 35 U.S.C. §102 and 103/Allowable Subject Matter

Claims 1, 2, 10, and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,469,444 to Leng et al. Claims 13, 21, and 22 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,834,895 to Dolan et al. Claims 5, 13, and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over Leng et al. in view of U.S. Patent No. 3,867,665 to Furmidge et al. Claims 3, 4, 6-9, 12, 14, 15, 17-20, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

Applicants appreciate the early indication of allowable subject matter. However, claims 3, 4, 6-9, 12, 14, 15, 17-20, and 23 have not been rewritten in independent form at this time since, as discussed below, it is believed that the independent claims from which they depend are allowable.

Independent claim 1 recites a combination of elements in a metal halogen electrodeless illumination lamp including a discharge bulb containing a full mixture of metal halogens which

emits visible optical radiation featuring a molecular spectrum, spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which the fill mixture of metal halogens includes halides of Sn and Al.

Independent claim 13 recites a combination of elements in a metal halogen electrodeless illumination lamp including a discharge bulb containing a fill mixture of metal halogens which emits visible optical radiation featuring a molecular spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which the fill mixture of metal halogens includes bismuth halide.

It is respectfully submitted that the combinations of elements set forth in independent claims 1 and 13 are not anticipated or rendered obvious by the prior art of record, including Leng et al., Dolan et al., and Furmidge et al.

In contrast to Applicants' claimed invention, Leng et al. merely discloses a lamp that includes a metallic cylindrical member 6, a metallic mesh 8, a spherical bulb 10, a stem 12, a motor 14, a magnetron 16, and a waveguide 18, as shown in FIG. 1. The metallic cylindrical member 6 and metallic mesh 8 are contained in a microwave cavity. The mesh 8 allows light to escape from the microwave cavity while retaining the microwave

energy inside, and the spherical bulb 10 is disposed in the microwave cavity and supported by the stem 12.

In discussing the related art, Leng et al. states that the color rendering index (CRI) for a sulfur lamp is about 80, whereas the CRI for a metal halides lamp is of about 70, and that a lamp with a CRI greater than or equal to about 90 would be considered a high quality color rendering lamp (column 1, lines 31-37). Any attempt to increase the CRI, however, is limited by the full width of half maximum (FWHM) of the visible spectrum of the lamps. In other words, an increase in red radiation results in a loss of blue radiation, thereby lowering the CRI. Blue or green radiation cannot be substantially increased by introducing metal halides into sulfur plasma, because sulfur molecules have strong self absorption in those regions (column 1, lines 56-62).

Thus, Leng et al. uses calcium and/or strontium halide as an additive to the fill of a sulfur, selenium, and/or tellurium lamp to improve the color rendering index. Leng et al. also discloses that a small amount of metal halide may be added to the fill to increase the vapor pressure of the calcium or strontium halide. In contrast, the claimed invention uses metal

halides (Sn and Al) as the main component (not as a volatilizer) and, as shown in the Examples, yields a CFI of about 90.

Dolan et al. discloses a lamp 2, which includes a bulb 3, a conductive housing 4, a mesh 5, a magnetron 6, a waveguide 7, and coupling slot 8, as shown in FIG. 1. Bulb 3 contains a high-pressure fill and is supported in a microwave cavity which comprises the conductive housing 4 and mesh 5.

Dolan et al. discloses using a small amount of bismuth as an additive in the fill to augment illumination of the lamp in various regions of the spectrum. This reference is the patent which issued from a continuation-in-part of U.S. Patent 5,404,076, which corresponds to the related art discussed in Leng et al. Not surprisingly then, low CRI is also a problem in Dolan et al.

Leng et al. and Dolan et al. disclose a metal halogen electrodeless illumination lamp including a lamp envelope in which sulfur or selenium is filled as a main component of a fill material. However, the main component of the fill material in the claimed invention is stannum (Sn) and aluminum (Al) or bismuth (Bi). Accordingly, the cited references and the claimed invention use different materials for the fill in an envelope. In addition, neither Leng et al. or Dolan et al. teaches or

suggests a lamp including only metal halides with a CRI about 90.

Neither Leng et al. nor Dolan et al. teaches or suggests a discharge bulb containing a full mixture of metal halogens which emits visible optical radiation featuring a molecular spectrum, spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which the fill mixture of metal halogens includes halides of Sn and Al, as recited in independent claim 1.

Neither Leng et al. nor Dolan et al. teaches or suggests a discharge bulb containing a fill mixture of metal halogens which emits visible optical radiation featuring a molecular spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which the fill mixture of metal halogens includes bismuth halide, as recited in independent claim 13.

In rejecting claims 5, 13, and 16, the Office Action relies on Furmidge et al. for a teaching of a bismuth halide, a tin halide, and an aluminum halide in combination with film material. However, Furmidge et al. does not teach or suggest the above-cited limitations of claims 1 and 13 and, therefore, fails to cure the deficiencies of Leng et al.

In view of the foregoing, it is respectfully submitted that independent claims 1 and 13 patentably distinguish over the cited art, and reconsideration and withdrawal of the rejections under 35 U.S.C. §102(b), §102(e), and §103(a) are requested.

Independent claims 1 and 13, as well as independent claims 24-37, are in condition for allowance. Since the remaining claims depend directly or indirectly from allowable independent claims, they should also be allowable for at least the reasons set forth above, as well as for the additional limitations provided by these claims. Therefore, all claims should be in condition for allowance.

Conclusion

All of the stated ground of rejection has been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

However, if there are any outstanding issues, the Examiner is invited to telephone Sam Bhattacharya, Reg. No. 48,107, at (703) 205-8000 in an effort to expedite prosecution.

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Group Art Unit 2882

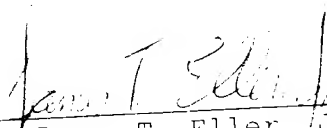
Attorney Docket No. 630-1176P
Amendment filed March 3, 2003
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Pursuant to 37 C.F.R. §§1.17 and 1.136(a), Applicants hereby request a one-month extension of time in which to file this reply. A check for the required fee of \$110 is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,
BIRCH, STEWART, KOLASCH & BIRCH, LLP

By


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630-1176P
Attachment
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MARKED-UP COPY OF AMENDMENTS

IN THE SPECIFICATION:

Please amend the paragraph beginning on page 1, line 17, as follows:

Metal halogen illumination lamps have been well known since [mid-60s] since the mid-1960's and have found extensive application owing to the high intensity of generated radiation. A metal halogen illumination lamp generally comprises a quartz tube filled with a mixture of substances capable of sustaining an arc discharge, and a glass [envelop] envelope enclosing said [quarts] quartz tube.

IN THE CLAIMS:

Please amend claims 1, 2, 6, 11-14, 17, 22, and 23 as follows:

1. (Amended) A metal halogen electrodeless illumination lamp, comprising a microwave generator coupled via [a] coupling means with a microwave cavity which contains a discharge bulb, and a microwave screen [its], the function [being] of which is performed by some part of walls of the microwave cavity [walls], which is transparent to optical radiation, said discharge bulb containing a fill mixture of metal halogens which emits visible

optical radiation featuring a molecular spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which said fill mixture of metal halogens includes halides of Sn and Al.

2. (Amended) The metal halogen electrodeless illumination lamp according to claim 1, wherein [said] a halogen component of said halides is [one] selected from the group consisting of chlorine, iodine [or] and bromine.

6. (Amended) The metal halogen electrodeless illumination lamp according to claim 5, wherein [said] a halogen component of said halides is [one] selected from the group consisting of chlorine, iodine [or] and bromine.

11. (Amended) The metal halogen electrodeless illumination lamp according to claim 1, wherein[, as] the inert gas[,] is argon or xenon [is used].

12. (Amended) The metal halogen electrodeless illumination lamp according to claim 1, wherein the discharge bulb additionally contains a small amount of [metals such as] at least one metal selected from the group consisting of Zn, Na, Li or [their compounds] a compound thereof.

13. (Amended) A metal halogen electrodeless illumination lamp, comprising a microwave generator coupled via a coupling means with a microwave cavity which contains a discharge bulb, and a microwave screen [its], the function [being] of which is performed by some part of walls of the microwave cavity [walls], which is transparent to optical radiation, said discharge bulb containing a fill mixture of metal halogens which emits visible optical radiation featuring a molecular spectrum, immediately when excited with a high frequency discharge, and an inert gas, of which said fill mixture of metal halogens includes bismuth halide.

14. (Amended) The metal halogen electrodeless illumination lamp according to claim 13, wherein [said] a halogen component of said halides is [one] selected from the group consisting of chlorine, iodine [or] and bromine.

17. (Amended) The metal halogen electrodeless illumination lamp according to claim 16, wherein [said] a halogen component of said halides is [one] selected from the group consisting of chlorine, iodine [or] and bromine.

22. (Amended) The metal halogen electrodeless illumination lamp according to claim 13, wherein[, as] the inert gas[,] is argon or xenon [is used].

23. (Amended) The metal halogen electrodeless illumination lamp according to claim 13, wherein the discharge bulb additionally contains a small amount of [metals such as] at least one metal selected from the group consisting of Zn, Na, Li or [their compounds] a compound thereof.

CLAIMS 24-37 ARE ADDED.